

N<sup>o</sup> 6650



A.D. 1909

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# COMPLETE SPECIFICATION.

## Improvements in Valve Gear for Internal Combustion Engines.

We, WILLIAM WARNER JUDD, of 49 Wimpole Road, Colchester, in the County of Essex, Engineer, and Messrs. DAVEY, PAXMAN & COMPANY, LIMITED, of the Standard Ironworks, in the Town and County aforesaid, Engineers, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to valve gear for internal combustion engines of the type in which the motion of the cam is imparted to the valve through a rocking lever and a coupling link, the connection of the link to the lever being variable for the purpose of enabling the amount the valve opens to be varied as desired, and it consists of an improved construction hereinafter particularly described.

In the accompanying drawing which illustrates this invention:—

Figure 1 is a view in elevation partly in section showing one application of the invention, and

Figure 2 is a similar view showing another application.

In both views similar parts are marked with like letters of reference.

Referring to Figure 1, the inlet valve A is of the usual type and construction being restored to and retained on its seating by the spring B. Over the free end of the stem a of the valve A is fixed a housing C on one side of which is pivoted a horizontally disposed arm D the free end of which contacts—preferably through a roller d—the free end of the stem a of the valve. Further remote from the free end of the stem of the valve and on the opposite side of the housing C is pivoted a rocking lever E of the first order. To one end e of this lever is coupled a rod F which receives motion from the cam X, the other end of said rod—which preferably carries a roller to contact the cam—being guided by a rocking arm or link f or its equivalent. The motion of the lever E is imparted to the arm D by means of a link H one end of which is pivotally connected to said arm at or about its free end, and its other end h engages—preferably by means of a roller h'—a slot e' in the other end of the lever E, the said slot being so shaped and arranged that when the valve A is closed, i.e. when the operative part of the cam is not in contact with the rod F, the end h of the link H can move throughout the length of the slot e' without imparting any motion to the arm D. It will therefore be seen that when the end h of the link H is at the end of the slot e' nearest to the point of pivot of the lever E the cam X will impart no movement to the arm D and the valve A will therefore remain closed and that when the end h of the link H is at the other end of the slot e' the full movement of the cam X will be imparted to the arm D and the valve A will be opened to its full extent. The position of the end h of the link H in the slot e' is controlled by any suitable form of centrifugal or other type of governor through any suitable mechanism of which the final coupling rod L only is shown in the drawings.

When the engine is governed by the quantity of gas in the charge we prefer to arrange the two valves A and A' for controlling the admission of the gas and the air respectively concentrically as shown in Figure 2, in which case the gas valve A would be operated in the manner hereinbefore described, and the air valve A'—the stem a' of which passes through the stem a of the

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*Improvements in Valve Gear for Internal Combustion Engines.*

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valve A—would be operated by the free end of the arm of the lever E containing the slot *e*<sup>1</sup>, so that while the lift of the gas valve is capable of variation the lift of the air valve remains constant. In this construction the spring B<sup>1</sup> for restoring the valve A<sup>1</sup> to and retaining it on its seating is preferably arranged above the stem *a*<sup>1</sup> of the valve and operates thereon by means of a plunger such as B<sup>1</sup>.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

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The improved valve gear for internal combustion engines, substantially as <sup>10</sup> described and shown.

Dated this 19th day of March, 1909.

PHILLIPPS,  
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Agents for the Applicants.

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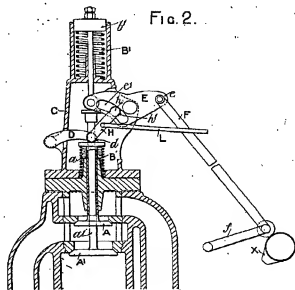
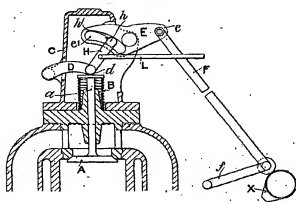
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 JUDG & MARY, COMPLETE REPLICATION.

(A SEVENTH)

FIG. 2.

FIG. 1.

[This Drawing is a reproduction of the Original as submitted under No. 1]



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FIG. 1.

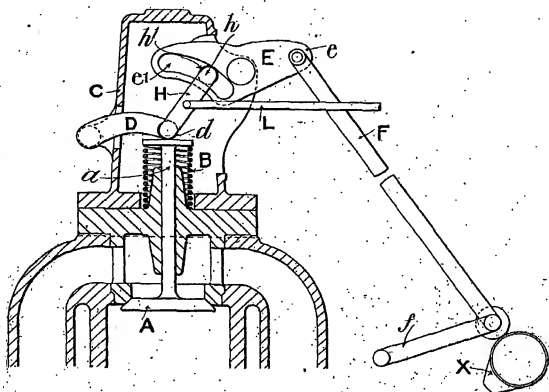
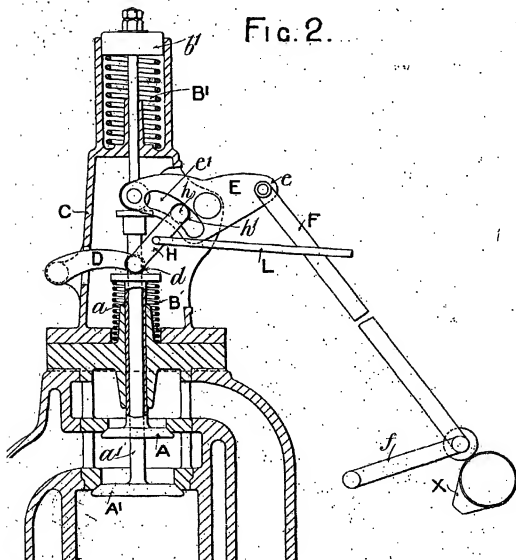


FIG. 2.



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